FLORENCE COPPER

FLORENCE COPPER INC.
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

February 17, 2021

Mr. David Albright
Manager, Groundwater Protection Section
USEPA Region 9 (WTR-4-2)
75 Hawthorne St
San Francisco, CA 94105

Subject: Underground Injection Control (UIC) Permit Number R9UIC-AZ3FY11-1
Notification of AL and AQL Exceedances at supplemental monitoring well M59-O

Dear Mr. Albright:

Florence Copper is providing this 30-day report for alert level (AL) and AQL level exceedances at supplemental monitor well M59-O under Underground Injection Control (UIC) Permit Number R9UIC-AZ3FY11-1 (Permit), Parts II.H.2.a.iv.A and II.H.2.b.iv.A, providing an evaluation of the cause, impacts, or mitigation of the AL exceedance.

On December 28, 2020, Florence Copper became aware of potential AL/AQL exceedances at supplemental monitor well M59-O from a sample collected 12/1/2020. The potential AL/AQL exceedances were for gross Alpha (adjusted), gross Beta, and radium. Potential AL exceedances for magnesium, sulfate, TDS, and total uranium were also noted. A verification sample was collected on December 29, 2020. Results from the verification sample confirmed the exceedances. As outlined in Part II.H.2.a.ii. and Part II.H.2.b.ii of the Permit, Florence Copper notified EPA Region 9 within five days of becoming aware on January 18, 2021 that the parameter exceedances listed in the table below have been confirmed.

Parameter	Initial Sample Result 12/28/20	Verification Sample Result 1/18/21	Type of Exceedance - AL or AQL - and Threshold
Magnesium	57.2 mg/L	63.1 mg/L	AL – 23 mg/L
Sulfate	865 mg/L	960 mg/L	AL –202 mg/L
Total dissolved solids (TDS)	1,860 mg/L	1800 mg/L	AL – 854 mg/L
Total Uranium	0.037 mg/L	0.038 mg/L	AL – 0.0052 mg/L
Adjusted Gross Alpha	73.5 ± 3.7 pCi/L	35.4 ± 2.5 pCi/L	AL and AQL – Both 15.8 pCi/L
Gross Beta	43.2 ± 2.7 pCi/L	52.7 ± 3 pCi/L	AL and AQL – Both 16 pCi/L
Radium 226+228	19.8 ± 0.8 pCi/L	22.0 ±0.8 pCi/L	AL and AQL - Both 6.9 pCi/L

As stated in the 5-day report, supplemental monitoring well M59-O is located on the east side of the PTF well field (see Figure 1). Analytical results for water quality samples taken from this well over the past year and a half have shown alert level exceedances for a number of analytes. Corrective actions that Florence Copper institutes when there is an alert level exceedance include sending a camera down the well to create a video log of the inside of the well. If the video log shows that precipitates have built up in the well, the well is redeveloped. The well may also be pumped continuously to try to clear out the precipitates. These corrective actions have been successful in lowering parameter concentrations below AL/AQL thresholds.

Florence Copper has evaluated the cause and impacts of the exceedances at supplemental monitoring well M59-O, and has implemented mitigation. No malfunction or failure of pollution control devices or other equipment or process occurred that contributed to the AL/AQL exceedances. Hydraulic control has been maintained as required by the permit throughout operation of the PTF, and continues today.

The cause of the exceedances at M59-O may be related to previous pumping activity conducted at this well. Florence Copper installed a submersible pump in M59-O on November 18, 2020 which was run to clean out any precipitates that may have accumulated on the well screen, and to collect the initial and verification groundwater samples for the quarter. Though pH levels remained above 7.0, pumping of M59-O increased the conductivity and the concentrations of indicator parameters and radio chemistries (see Figures 2 and 3).

A review of data from wells in this area of the wellfield suggest that pumping M59-O in November and December may have drawn water from nearby observation well O-02 towards M59-O. Observation well O-02 is approximately 100 feet west of supplemental monitoring well M59-O (Figure 1). Water level data show that when M59-O was pumped in December, groundwater elevations at O-02 decreased by seven feet, and recovered quickly when pumping stopped (see Figure 4).

The submersible pump was removed from M59-O and a video log of the well was conducted on January 8, 2021, the results of which showed a relatively clear screened interval. Additional video logging of wells in January showed that O-02 contained thick gypsum precipitates on the well screen. Precipitates in this well had likely been building up due to rinsing activities in the wellfield, which began in June 2020.

A number of mitigation measures were initiated to decrease the parameters in M59-O below the AL/AQL thresholds. First, observation well O-02 was redeveloped from February 3-5, 2021 to remove the gypsum precipitates. Second, a submersible pump was installed in O-02 on February 9, 2021, and is currently being pumped at 5 gallons per minute. Third, the pumping rate at recovery well R-02 was increased. Recovery well R-02 is located 75 feet west of observation well O-02. Hydraulic control has been maintained during these mitigation activities.

On February 16, 2021, a week after pumping began at observation well O-02, a conductivity measurement was taken at M59-O, and the results showed that the conductivity had decreased by approximately 1,000 µS/cm. This data point is included in the conductivity concentration versus time

FLORENCE COPPER

FLORENCE COPPER INC.
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

graph in Figure 2. Also, water level measurements taken at the time of the conductivity sampling showed an inward gradient with approximately a ten-foot differential in head between O-02 and M59-O. A water quality sample is scheduled to be collected from M59-O the week of February 22, 2021.

Please feel free to contact me should you have any questions or comments.

Sincerely,
Florence Copper, Inc.

FOR BRENT BERG

Brent Berg
General Manager

Cc: Nancy Rumrill, EPA Region 9
Maribeth Greenslade, ADEQ

FIGURES

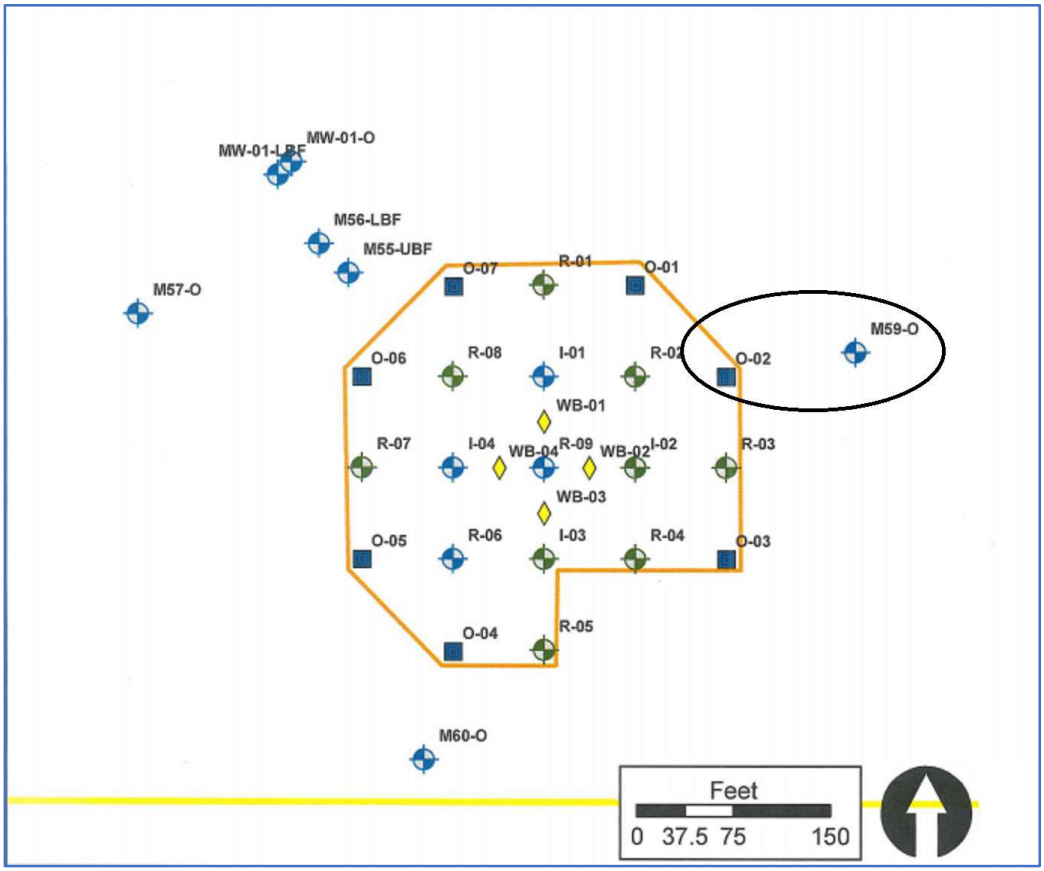

Figure 1. PTF Wellfield

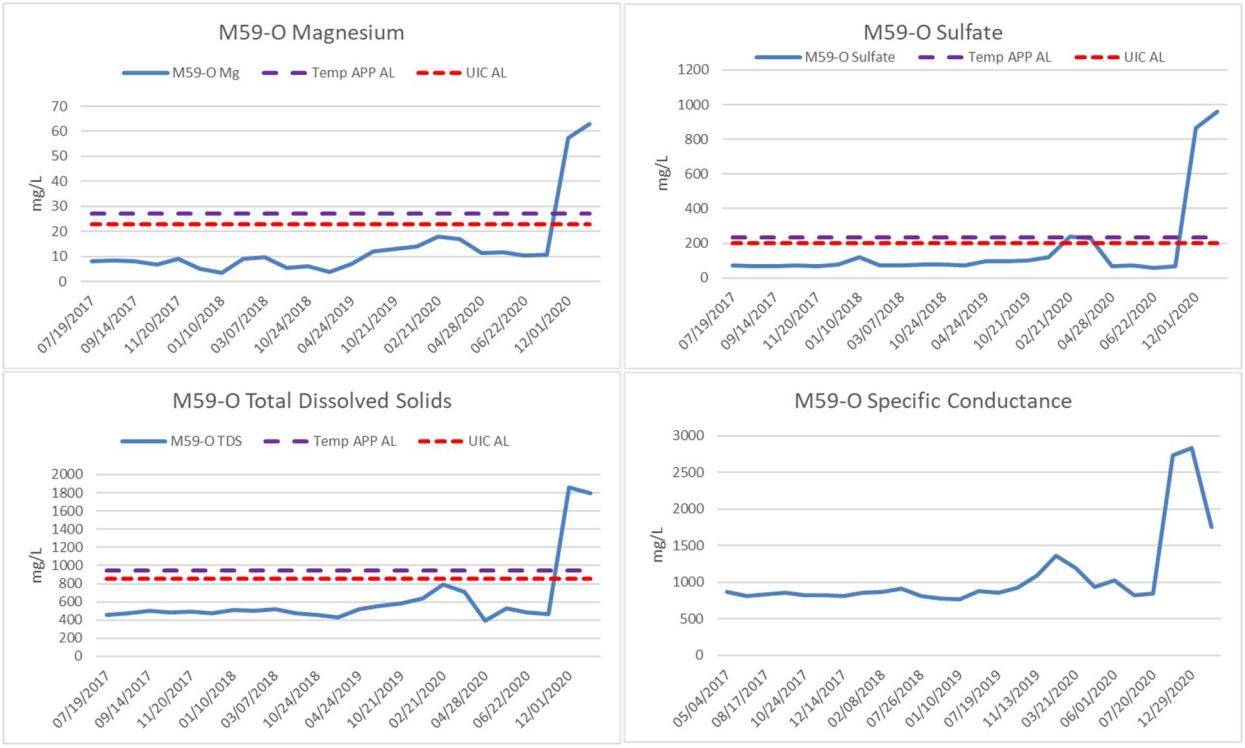

Figure 2. Indicator parameters and conductivity concentrations vs time at M59-O

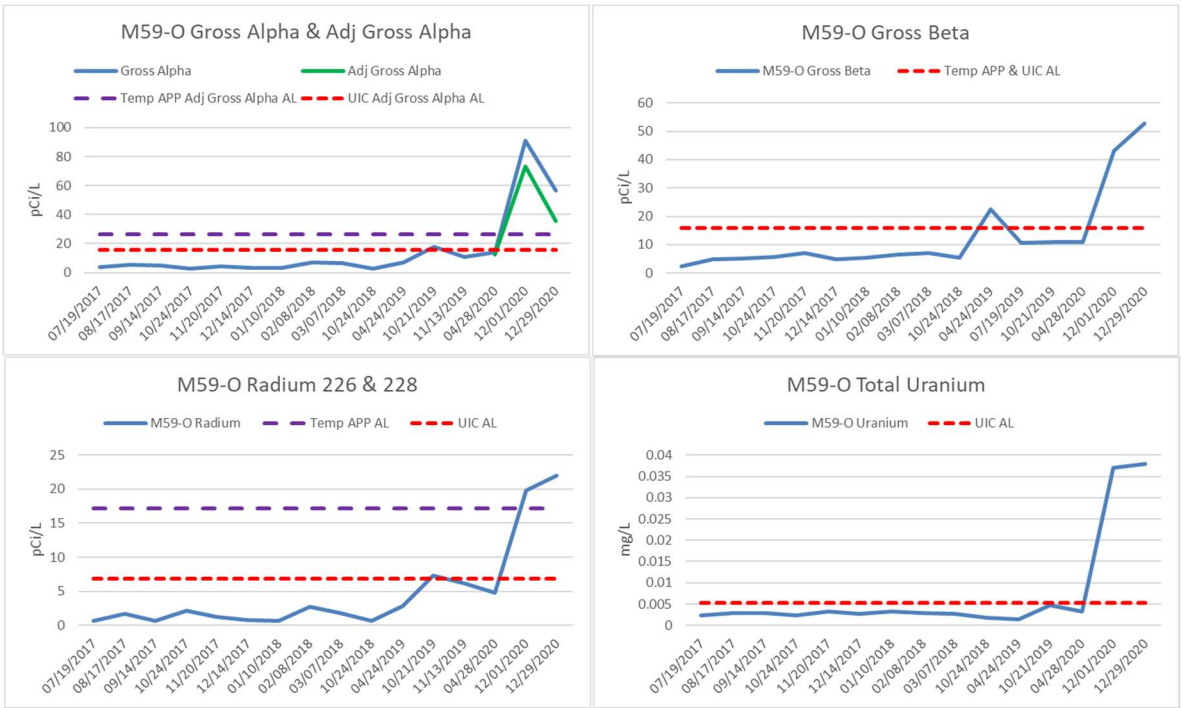

Figure 3. Radio chemistries at M59-O (Adjusted gross alpha is only calculated if gross alpha is >12 pCi/L.)

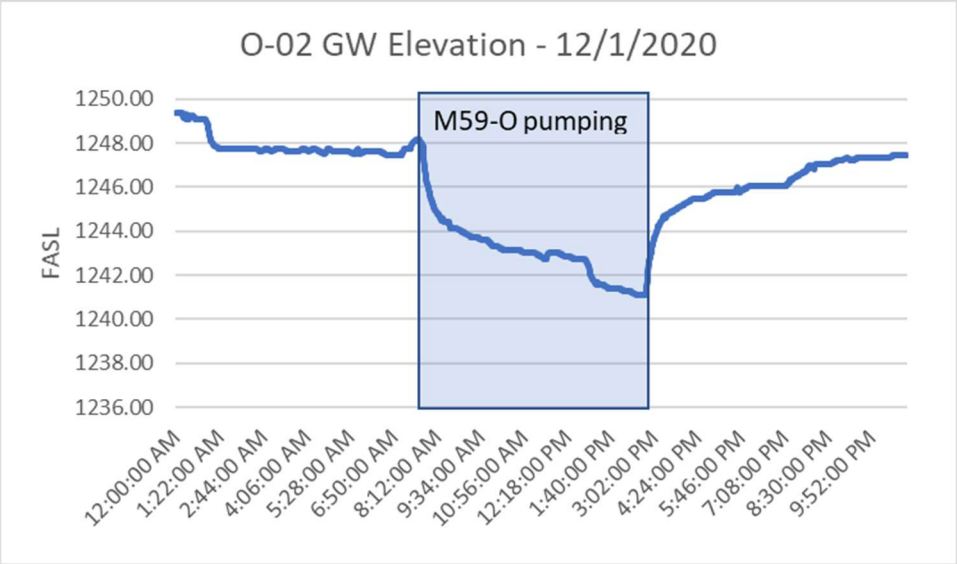

Figure 4. Drawdown at Observation Well O-02 while pumping M59-O